8. Select the Source

This chapter describes how industry submits proposals in response to the Request for Proposal (RFP) and how the Source Selection Evaluation Board (SSEB) evaluates the proposals to put the best solution under contract.

In particular, this chapter covers the following topics:

- Understanding the new process
- Understanding the key insights and redesign ideas
- The step-by-step process

8.1 Understanding the New Process

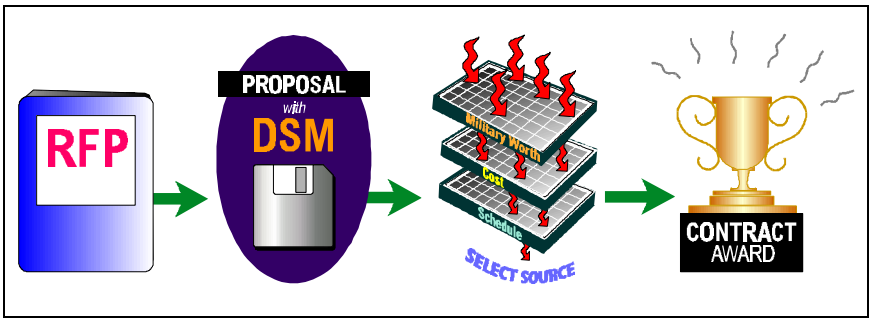


Figure 8-1. Source Selection Process Flow. *Under the Partnership Process, source selection is basically unchanged; the main difference is the addition of the Military Worth Method.*

8.1.1 Finding the Best Solution

This chapter shows how source selection uses the Military Worth Method and the trade space concept.

In the previous three activity chapters, we saw how the Military Worth Method supports the activities of quantifying mission deficiencies, establishing requirements, and conveying requirements. Similarly, we saw how the concept of a trade space helps us establish and convey requirements that give industry more latitude in designing innovative solutions.

This chapter shows how source selection uses the Military Worth Method and the trade space concept to drive industry and government toward finding the best solution to the warfighter's needs.

Under the Partnership, the source selection process is basically unchanged. However, the Partnership now requires government and industry to include additional information and make additional considerations when submitting and evaluating proposals.

Industry Submits Proposals to Government

Today, the RFP is geared toward eliciting a solution from industry, not dictating one.

In the past, the government created the specifications for the system it wanted to acquire and then relayed the specifications to industry in an RFP. Today, the RFP is geared toward eliciting a solution from industry, not dictating one, and the purpose of a proposal is to describe the details of each contractor's proposed solution, including:

- Specifications of the solution
- Military worth of the solution
- Contractor's Insight Plan

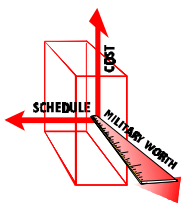
Government Evaluates Proposals for Military Worth

In the past, the government evaluated proposals for compliance with the specifications in the RFP. Today, the government evaluates proposals for their military worth and the credibility of their technical details. These steps include:

- Validate the contractor's claims of military worth.
- Compare the solution to the threshold and objective.
- Review the value of exceeding the threshold.

8.1.2 Using Objective Information in Source Selection

Under the Partnership, the most significant change in this stage of the acquisition is the wealth of *objective* information available to help government find the best solution:



- First and foremost, the Military Worth Method allows us to make "apples-to-apples" comparisons between different solutions by evaluating how well each solution meets the needs of the warfighter. This method lets us evaluate all proposed solutions in terms of a common yardstick—for example, the ability to put more targets at risk.
- Second, an analysis of alternatives allows us to make meaningful choices within the trade space defined by the three criteria of military worth, cost, and schedule.

- Finally, the widespread availability of digital system models (DSMs) allows us to see inside each solution and understand how it achieves its level of military worth.

8.1.3 Understanding Source Selection by DoD 5000 Phase

Selecting the source happens during every phase of an acquisition, from concept exploration through production. Figure 8-2 indicates the tasks that are specific to each phase. The principles we discuss in this chapter can guide participants in every phase.

DoD 5000 Phase	Distinguishing Features of Each Phase
Phase 0: Concept Exploration	• Typically many bidders • DSM is focused on conceptual architecture to drive out technology issues • Incentive is on innovation
Phase I: Program Definition and Risk Reduction	• Typically many bidders • DSM is focused on subsystem issues • Incentive is on risk reduction
Phase II: Engineering and Manufacturing Development	• Few bidders • Complete system DSM • Incentive is on best value
Phase III: Production, Fielding/Deployment, and Operational Support	• Typically downselect • Manufacturing processes well modeled • Incentive is on reducing cost

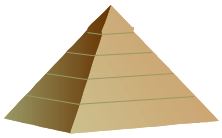
Figure 8-2. Source Selection by DoD 5000 Phase. *The specific activities involved in selecting the source will vary depending on the phase of the acquisition, but the approach toward selection should be consistent.*

Regardless of the acquisition phase, the purpose of selecting the source is to evaluate the proposed solutions according to established criteria and select the source that provides the best solution for the warfighter.

8.2 Understanding the Key Insights and Redesign Ideas

Key Insights and Redesign Ideas	
	• Use RFPs and proposals to validate military worth. • Use methods to determine best value. • Communicate information to government using a digital system model (DSM).

8.2.1 Use RFPs and Proposals to Validate Military Worth



Military worth is the cornerstone of the Partnership Process and a significant part of source selection. Requirements are based on military worth (since deficiencies are expressed in high-level measures such as targets at risk), requirements are conveyed to industry in terms of military worth, and the SSEB evaluates proposals for the military worth of the proposed solutions.

In the past, proposals were evaluated for compliance with the specifications in the RFP. The basis of the proposal was the compliance matrix, and it was difficult to assess differences in system capability from the information in the proposal.

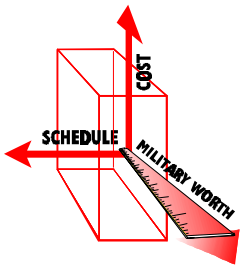
For more information on DSMs, see Section 8.2.3.

Today, proposals are evaluated for military worth and the credibility of their specifications. The SSEB determines if the specifications in a contractor's proposal can produce the level of military worth claimed by the contractor. The DSM provides the link between system specifications and performance.

The advantages of basing proposal evaluation on military worth are:

- Proposals are evaluated more objectively, using a common yardstick for all proposals.
- Proposal evaluation connects back to the voice of the warfighter, because proposals are evaluated for military worth.

8.2.2 Use Methods to Determine Best Value



Source selection requires a method that ranks proposals to select the winner. The Partnership Process uses a best value method based on assessing military worth, cost, and schedule.

In the past, there was no single parameter that could be associated with performance. To obtain a makeshift measure of performance, several lower-level parameters were combined, but this involved weighting the parameters subjectively.

Today, we use the Military Worth Method, in which all performance parameters can be aggregated into a single performance value. We can then use this value in our best value evaluation. The essence of the Partnership's best value method is to first relate performance with cost, then consider the effects of schedule and risk.

The benefits of using the Partnership's best value method for source selection are:

- Military worth is assessed more objectively, since there is no need for subjective weighting techniques.
- The method provides insight into warfighter utility and its relationship to cost, schedule, and risk.
- The method ensures that source selection will result in better, faster, and cheaper solutions.

8.2.3 Communicate Information to Government Using a Digital System Model

A digital system model (DSM) is a mathematical representation of industry's proposed solution. Using a DSM, industry can take computerized threat models from the government's standard threat library, match the proposed solution against the threat, and generate a probability of kill (P_k) grid that shows how the solution will perform against the threat.

A DSM is accompanied by explanatory information, such as the assumptions, constraints, theory, and past data that went into making the DSM. This information explains the model's capabilities and limitations.

Industry has used similar models for years to develop and test their systems. Today, industry is required to include these models in their proposals so that government can validate the military worth of the proposed solutions. When a P_k grid generated by a DSM (along with a 1-v-1 engagement simulation) is modeled in a program such as SUPPRESSOR, the government can see how the solution will contribute to mission level objectives such as putting more targets at risk.

Benefits of Using DSMs

When a DSM is included in a contractor's proposal, the government has more confidence in the contractor's solution. In the past, a proposal could possibly gloss over weaknesses in the contractor's proposed solution. But to give an accurate model of the solution, the DSM must show both the solution's capabilities and any weaknesses. The government will have greater insight into the contractor's solution—how the solution performs against each threat and how the contractor traded performance between threats to reach the solution's overall level of military worth.

Concerns with Using DSMs

Cost. One concern with using DSMs is that they're costly. However, contractors already use models to develop their systems. Creating a DSM is not really a new expense. The real difference is that, in the past, contractors neither volunteered nor were required to include their models in their proposals.

Compatibility. Another concern is that the government is forcing contractors to fit into a standard modeling framework. It is true that a contractor's model must be able to input threat data and output P_k grids. In the future, a contractor will be able to use any kind of models, as long as they produce a P_k grid that can be used by SUPPRESSOR or an object-oriented, open architecture modeling tool.

We will encourage the use of accepted models. But when using accepted models is not practical, the government will work with industry to "accept" nonstandard fidelity in the area of interest.

Since both government and industry will benefit if the DSMs are compliant with high-level architecture (HLA), we expect this level of compatibility to become commonplace.

Validation of the DSM will occur eventually, when its predictions are compared against actual results. See Chapter10 for more information.

Validation. A final concern is that the government will now be expected to completely validate a contractor's DSM. This is not true. A DSM can offer persuasive evidence of a system's abilities, but it is not intended to offer ironclad proof. The same can be said of a traditional proposal.

In general, a DSM has a higher level of believability than a traditional proposal. A detailed model such as a DSM must be consistent both with the outside world and within the model itself. If a contractor intended to misrepresent its system, this would be much harder to accomplish in a DSM than in a traditional proposal. In short, the government needs to review DSMs with some skepticism, but perhaps with less skepticism than traditional proposals.

Understanding How the DSM Links System Characteristics to Military Worth

Figure 8-3 shows how the DSM links system characteristics to military worth. Threat data and intelligence are modeled by government in a program such as an object-oriented, open architecture modeling tool. The resulting threat models are distributed to industry in the RFP.

DSMs can give P_k results either as ring shrinkage or as point-by-point data.

The contractor uses the threat models, along with the characteristics of its proposed system, to create the DSM. The DSM (along with a 1-v-1 engagement simulation) outputs P_k grids, which the contractor gives to the government in its proposal.

The government runs the contractor's P_k grids past the threats in a program such as SUPPRESSOR or a quick-turn analysis tool to determine how many missions are successful. This information equates to targets at risk, which is an appropriate measure for military worth.

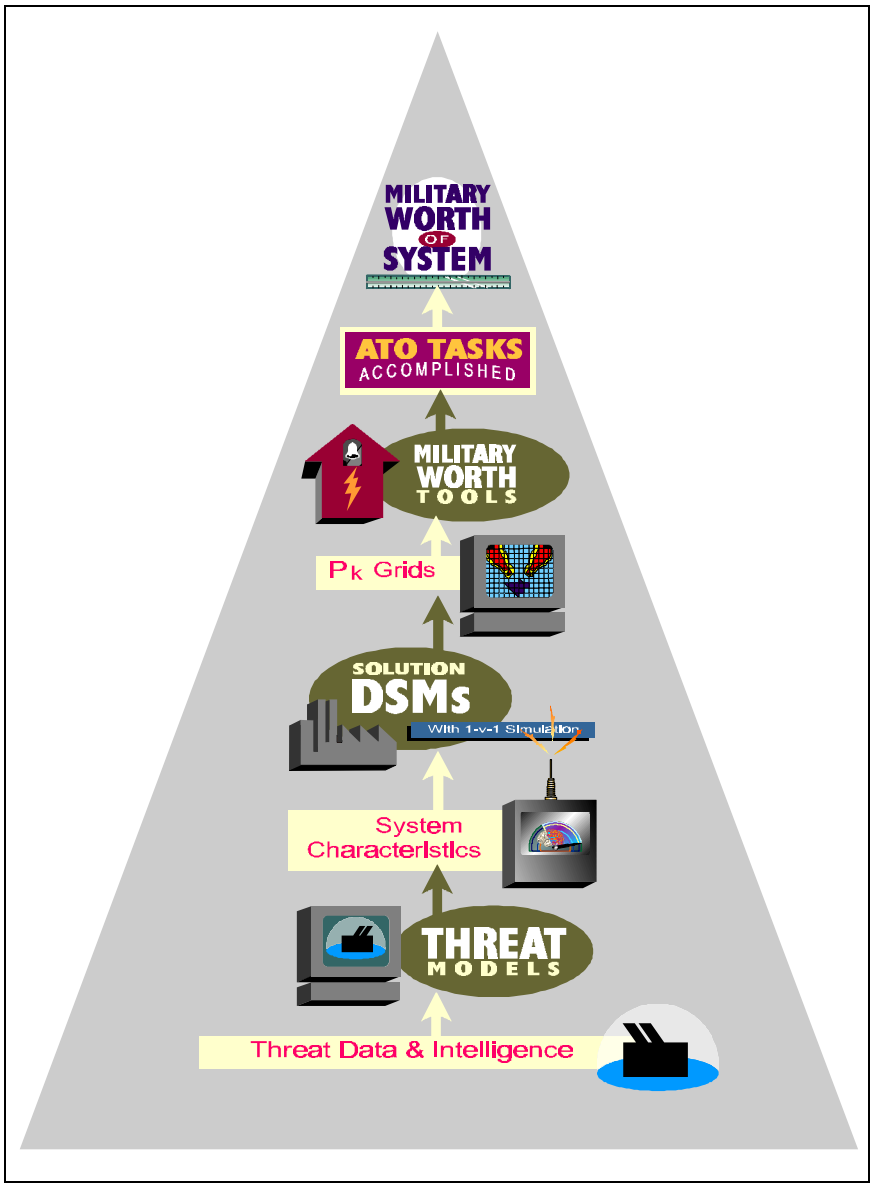
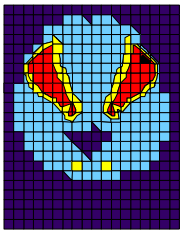


Figure 8-3. Linking System Characteristics to Military Worth. *DSMs link information such as threat data and system characteristics to the military worth of the system.*

Note that the links between modeling programs can be designed to work with current programs such as SUPPRESSOR and future object-oriented, open architecture modeling tools. This ensures that there will be a smooth transition to the time when all modeling programs can operate within the object-oriented, open architecture framework.



Generating P_k Grids from DSMs

Currently, DSMs don't directly produce P_k grids—tools such as ESAMS and the self-protection analysis model (SPAM) are needed to perform this function. The Partnership's vision is that industry will be able to extend its system models (including the 1-v-1 engagement simulations) to provide P_k grids as output. To do this, industry must have access to the tools we have described as well as the underlying data that drive them, such as the threat models in the consolidated threat library.

The Partnership encourages industry to build on the existing engagement models to provide a better characterization of how its solutions counter threats. There is room for improvement because most existing engagement models are highly threat-driven and have less capability to deal with new solutions. An improved engagement model would have greater flexibility to represent threats and solutions.

8.3 The Step-by-Step Process

The following steps describe how the source selection process is carried out.

8.3.1 Beginning with the RFP

In Chapter 7, government conveyed its requirements to industry in a Request For Proposal (RFP). This RFP included an ORD, the modeling and simulation toolset, the criteria for evaluating proposals, the SOO, and the threat library and threat scenarios. However, the RFP contained *no specifications*.

In this chapter, industry responds to the RFP with proposals. The following sections describe the contents of industry's proposals and how the SSEB evaluates the proposals to select a source.

8.3.2 Submitting Proposals

In the past, industry submitted its proposals to the SSEB, who evaluated the proposals for cost, schedule, and risk, and then selected the source. Under the Partnership, the process of source selection is basically unchanged. However, the Partnership now requires government and industry to include additional information and make additional considerations when submitting and evaluating proposals.

The following sections explain the new aspects of how contractors submit their proposals, including:

- Proposal and specification format
- Digital system model
- Insight Plan
- Oral presentations
- Risk tools

Proposal and Specification Format

The biggest change in the format of a proposal is that it now includes industry's specifications for its proposed solution.

The biggest change in the format of a proposal is that it now includes industry's specifications for its proposed solution. In the past, the government created the specifications and relayed them to industry in the RFP. The purpose of industry's proposal was mainly to present its cost for meeting the specifications. Today, the RFP is geared toward eliciting a solution from industry, not dictating one, and the purpose of the proposal is to describe the details of each contractor's proposed solution.

We anticipate that the format of the specifications will not be as important as the specifications themselves. Contractors should present their specifications in the most accessible format.

In addition, the proposal will be submitted electronically, including material such as text documents, DSMs, and cost spreadsheets. Government will specify the document formats and software versions in the RFP.

Digital System Model

Each proposal includes a Digital System Model (DSM) of its solution. See Section 8.2.3 for a description of the DSM.

Insight Plan

The Insight Plan is a true breakthrough concept, since it defines how the contractor will share information with the government.

In addition to specifications and the DSM, a proposal will also include an Insight Plan. The Insight Plan defines how the contractor will share information with the government. This is a true breakthrough concept, since government traditionally decided how programs would be monitored and then monitored all programs the same way.

In contrast, the Insight Plan specifies what level of information the contractor will provide the government, how often the information will be updated, and how the government can access the information. A good Insight Plan gives government the information it needs while minimizing the burden on the

contractor. This lets the contractor manage the details of the program and still allows the government to see how the program is progressing. Of course, the government will review proposed Insight Plans and use them as a factor in source selection.

As we will see in Chapter 9, the range of possible specifications initially proposed by the contractor will narrow as the solution is developed. For this reason, the contractor should keep the government informed about the trades it makes between different aspects of the system. However, in the proposal not all of these trades need to be reported.

In general, the contractor should report any data that will directly affect the military worth of the solution. While some specifications will tie directly to military worth, others will affect military worth only indirectly or in combination. A well-prepared Insight Plan will give data to the government at a level and schedule that allows it to continuously link system specifications to performance.

Oral Presentations

The government has allowed contractors to make oral presentations of their proposals before the SSEB.

Under certain circumstances, the government has allowed contractors to make oral presentations of their proposals before the SSEB. The Partnership Process encourages contractors to use this option in addition to submitting their written proposals. The benefits of oral presentations are:

- Gives the SSEB immediate insight into the key points of the proposal.
- Facilitates interchange and clarification between the contractor and the SSEB. The board can ask the contractor questions and have its questions clarified immediately.
- Allows the SSEB to find any major concerns with a proposal before reading the entire document. The SSEB could possibly reject a proposal on the basis of the oral presentation, but would not accept a proposal on this basis alone.

Risk Tools

When making its proposal, a contractor could use a graph like the one in Figure 8-4 to illustrate the technological maturity of the different components in its proposed system. Higher technological maturity normally equals less risk.

The technical maturity numbers on the vertical axis correspond to the following evaluations:

1—Basic principles observed
2—Conceptual design formulated
3—Conceptual design tested analytically or experimentally
4—Critical function/characteristics demonstrated
5—Component/brassboard tested in relevant environment
6—Prototype tested in relevant environment
7—Engineering model tested in flight
8—Flight-qualified system
9—Flight-proven system

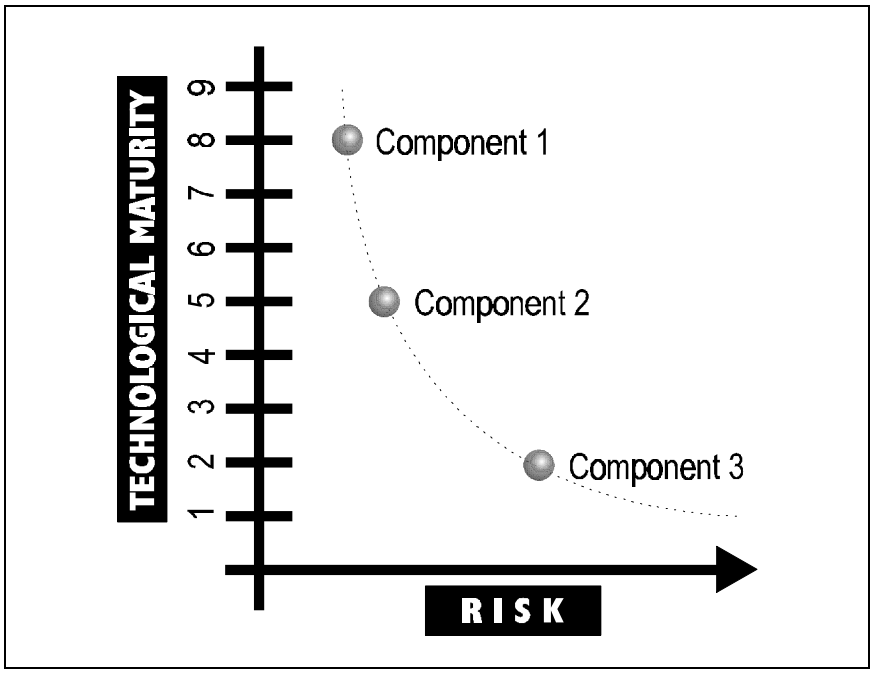
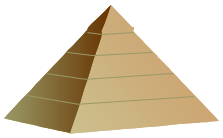


Figure 8-4. Technological Maturity Versus Risk. *Higher technological maturity of a system component normally equals less risk.*

8.3.3 Evaluating Proposals for Military Worth

In the past, government evaluated proposals to determine whether the contractor could meet the thresholds for cost, schedule, and risk. Today, government is responsible for:

- Validating the contractor's claims of military worth
- Comparing the solution to the threshold and objective
- Giving decision makers better information
- Reviewing the value of exceeding the threshold



Validating the Contractor's Claims of Military Worth

As we saw in Section 8.2.3, the contractor submits a DSM with its proposal to show how the solution performs in given scenarios. The DSM (along with a 1-v-1 engagement simulation) generates a P_k grid, which can be run in a model such as SUPPRESSOR to show how the solution enables the military to put more targets at risk.

In the source selection stage, the SSEB reviews the contractor's DSM to determine if its outputs make sense given current military worth models. As we mentioned before, a DSM in a proposal is not intended to offer ironclad proof of a system's capabilities. Instead, it is a detailed, comprehensive model of the system that must still be reviewed with an appropriate amount of skepticism.

When reviewing the DSM, the SSEB should check the links between the levels of capability that describe the contractor's solution. In other words, the SSEB should be able to trace the linkage from the technical attributes of the system to offset reduction (RiO).

For more information on quick-turn analysis tools, see Section 4.5.3.

A quick-turn analysis tool provides the means to evaluate military worth so that the SSEB can focus on evaluating the technical credibility of the proposed solution. Once the initial quick-turn analysis tool runs verify that the solution *does* achieve a certain level of military worth, the SSEB can scrutinize the solution to determine *how* it achieves its military worth.

Comparing Solutions to the Threshold and Objective

Once the contractors' military worth claims have been validated, the SSEB plots the solutions on a graph that shows the threshold, the objective, the cost goal, and the maximum cost. A graph such as the one in Figure 8-5 allows the SSEB to quickly compare the value (military worth versus cost) of the different solutions.

For example, the graph allows the SSEB to quickly eliminate two of the four solutions. One solution falls outside the bounded area because it's both too high on cost and too low on performance. Two other solutions provide approximately the same military worth, but one is cheaper. The last solution provides a higher level of military worth, but also carries a higher cost.

Once the two most unpromising solutions are eliminated, the remaining two solutions (circled) can then be evaluated in more detail.

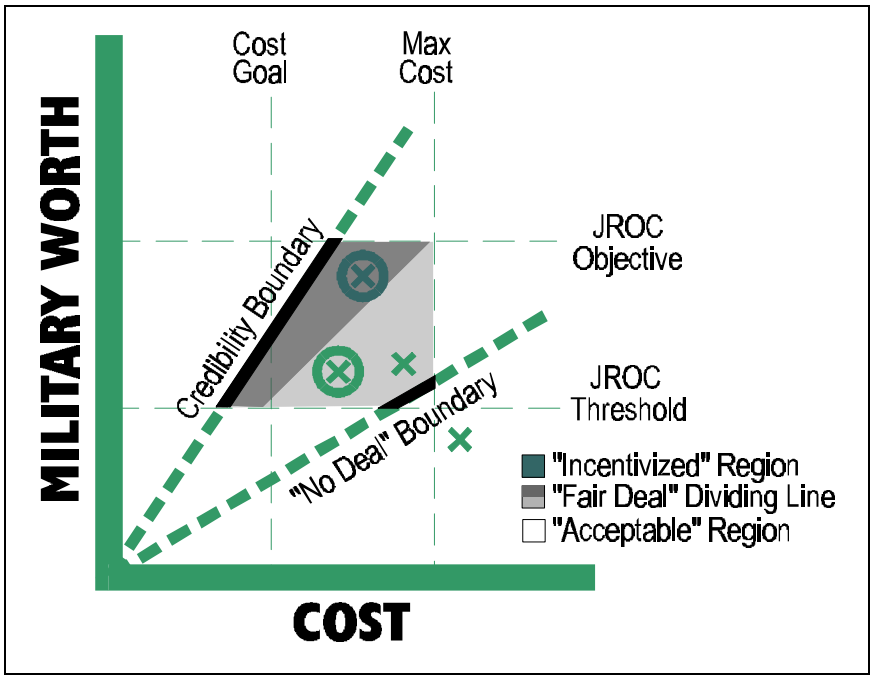


Figure 8-5. Comparing Solutions to the Threshold and Objective. *A graph such as this one allows the SSEB to eliminate some solutions and focus on the more promising ones (circled).*

In Figure 8-5, JROC stands for Joint Requirements Oversight Council.

Figure 8-5 also shows boundaries in the cost versus performance trade space that demonstrate the concept of cost as an independent variable (CAIV). The lower boundary is the "no deal" line. Solutions below this line have a lower performance-to-cost ratio than the SSEB will accept. The upper boundary is the "credibility" line. Solutions above this line have a higher performance-to-cost ratio than the SSEB believes is realistic. Such solutions should be carefully scrutinized.

These analyses do not represent a formula for source selection.

The line through the middle of the bounded area is the desired cost/performance curve, or the "fair deal" line. This line represents the government's sense of what would be a fair cost for a given level of performance. The government potentially will accept solutions below this line, but the government might not have a favorable opinion of the contractor's performance. The government would rather accept solutions above this line and create incentives for the contractor to produce those solutions.

CAIV should not be confused with other approaches such as design-to-cost or minimum cost within acceptable performance. These two methods constrain either cost or performance, while CAIV encourages a cost-benefit trade space.

Note that the credibility line, no deal line, and fair deal line might not be perfectly straight as they are in Figure 8-5. For example, the lines could be exponentially or irregularly curved.

Giving Decision Makers Better Information

The analyses conducted in the previous subsection do not represent a formula for source selection—decision makers still have the authority to make decisions as they see fit. The analyses simply give them better information than what has traditionally been available.

In the past, decision makers knew what the government's measures were; now the government can match industry's numbers to these measures. In addition, decisions must be weighed against the year when the deficiency needs to be corrected, the funds currently available, and the level of risk acceptable.

In effect, these analyses allow decision makers to see the range of industry's proposed solutions and perform "comparison shopping."

Reviewing the Value of Exceeding the Threshold

In Figure 8-5, we saw how proposals could differ in the amount of military worth they provide, the cost they require, and the way they relate to the threshold and objective. The example also showed that two competitive proposals could offer similar benefit-to-cost ratios.

In this type of situation, the SSEB must carefully assess the added benefit versus the added cost of each proposal to determine which one is the better value. Other considerations (such as technical credibility, schedule feasibility, and risk) may tip the balance, but the benefit-to-cost evaluation is usually the most important and difficult assessment that the SSEB will make.

8.3.4 Selecting the Source

The Partnership Process gives the SSEB the analytical, objective tools to help it make more informed decisions.

Once the SSEB has evaluated all proposals and validated their data, it selects the source. While the Partnership Process provides many rigorous tools that the SSEB should use to select the source, these tools must be used with insight and expertise. In other words, the tools and analyses described in this chapter do not add up to a formula for selecting the source. We are not advocating source selection by spreadsheet. Instead, the Partnership Process gives the SSEB the analytical, objective tools to help it make more informed decisions.

Under the Partnership Process, the source selection stage of the acquisition is basically unchanged; the main difference is the addition of the Military Worth Method. The SSEB must still evaluate the cost, schedule, and risk of each proposed solution.

However, the board now has a quantified, objective measure of the military worth of each solution that must be considered along with the other factors.

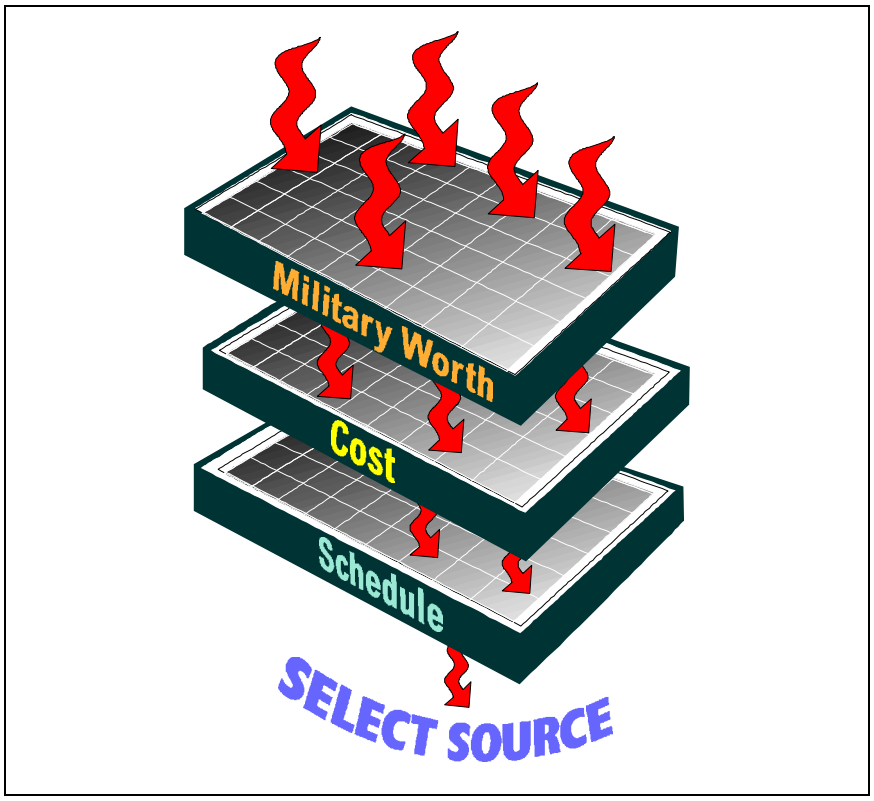


Figure 8-6. Filtering Proposals. *The SSEB evaluates proposals according to their military worth, cost, and schedule, as well as other factors such as risk and the contractor's Insight Plan.*

Contract Evaluation and Negotiation

Once the government has identified its most promising solution, there is still room for compromise. In its analysis of a particular solution's military worth, the SSEB might find that the contractor didn't take certain factors into account. The SSEB could then revise the military worth calculation based on more complete data. If this calculation affects the final military worth, the government can determine if the cost of the solution is still appropriate.

Summary

In this chapter, the Source Selection Evaluation Board evaluated industry's proposals to put the best solution under contract. In Chapter 9, we will see how the Partnership approach affects program management and explain our new approach to moving from the contract award to a test item.